Esophageal Impacted Dentures

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Objectives: This study aims to highlight the problems associated with impacted acrylic dentures and proffers advice to check them.

Patients and Methods: Retrospective review of all cases of impacted acrylic dentures over a 16-year period.

Results: Twenty-two adults had impacted esophageal acrylic dentures of which 16 (72.7%) and six (27.3%) were males and females, respectively (M:F ratio = 2.7:1) with age range 23–77 years. Fourteen patients (63.6%) had worn their dentures for more than 10 years without check-up, and 54.5% presented within 48 hours of impaction. The common symptoms in all the patients were difficulty with swallowing, throat pain and discomfort, followed by tenderness in the neck in 15 (68.2%). Dentures were extracted through esophagoscopy (17 cases) and cervical (three cases) esophagotomy, respectively. Observed complications included pulmonary edema in one and esophageal perforation in five patients.

Conclusion: Endoscopic extraction of dentures carries a high risk of perforation. Extraction of an impacted denture via esophagoscopy can be undertaken under direct vision and in an ideal situation with judicious use of the Shears forceps. In the absence of these, the safest option is an esophagotomy. Proper treatment planning in the fabrication of dentures with incorporation of radiopaque materials in the dental resins and adequate postdenture delivery instructions are necessary as preventive measures.

Key words: denture ■ barium swallow ■ esophagoscopy ■ cervical esophagotomy ■ thoracotomy

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INTRODUCTION

The tooth contributes to the esthetic appearance of the face. Biographers and playwrights, among others, in portraying the facial appearance of their characters, have employed this feature.[1] While in the past early European visitors to Nigeria admired her natives "perfect row of white teeth," the converse is true now[2] as a result of tooth loss due to caries and periodontal disease. This situation has led to an increase in the number of people wearing dentures in our environment[3] and, thus, a proportionate increase in the incidence of esophageal impacted dentures.[4,5]

Impaction of dentures in the esophagus is not rare in Nigeria. Most patients are aware of the diagnosis before seeking treatment. Exceptions to this are children, the mentally handicapped, and those under the influence of alcohol. In addition, acrylic dentures are associated with reduced sensitivity of the oral cavity because of the insulating nature of the resins used in their fabrication.[6]

Earlier reports from Nigeria,[4,5] reviewed esophageal foreign bodies in general, except that of Nwafo et al.[2] that reviewed three cases of impacted dentures. The present communication reports our experience with 22 cases of impacted acrylic dentures seen and managed in the Department of Otorhinolaryngology (ORL), University College Hospital (UCH), Ibadan, Nigeria, highlighting the associated problems with suggestions on improving the prognosis of these patients.

Materials and Methods

This is a retrospective study of all patients with history of impacted acrylic dentures in the esophagus seen and treated in the ORL-UCH over a 16-year (January 1987– December 2002) period.

Data collection entailed sorting out all cases of impacted esophageal foreign bodies in adults from the ORL operating theater register. The case files of those with impacted acrylic dentures were retrieved. Information extracted included patient's age, sex, presenting complaints, and duration of symptoms

before presentation and hospitalization. Also noted was the type of acrylic denture (upper or lower) and palatal plate (dental plate which is fitted in patients who had maxillectomy or palatal fenestration as a result of cancer of the region), surgical option, relevant radiological features, and complications.

SPSS version 11 statistical software package was used for data analysis. The frequencies of the variables were generated, and the means and standard deviation computed. The results are presented in simple descriptive, tabular, and pictorial forms.

RESULTS

Fifty-seven adults had impacted esophageal foreign bodies of various forms of which 22 (38.6%) were dentures during the study period. With regard to the impacted dentures, 16 (72.7%) and six (27.3%) were males and females, respectively, with a male:female ratio of 2.7:1. The age of the patients ranged 23–77 years, with a mean of 48.7 years (SD ± 17.7). The mean duration before presentation was four days (SD ± 3.5) with a range of one- to 15 days. However, the majority (54.5%) presented within 48 hours of impaction (Figure 1).

Presenting Features

The commonest complaint in all the patients was throat pain or discomfort, while persistent sensation of foreign body in the throat was noted in 18 (81.8%) patients. The common signs were tenderness in the neck [15 (68.2%) patients] and pooling of saliva in the oropharynx [seven (31.8%) patients] (Table 1).

Table 1. Clinical Features of Impacted Esophageal Dentures

Clinical Features	Number of Patients	Percentage (%)
Symptoms		
Pain/Discomfort in the throat	22	100
Foreign body sensation in the throat	18	81
Hoarseness	3	13.6
Fever	3	13.6
Referred otalgia	2	9.1
Signs		
Neck tenderness	15	68.2
Pooling of saliva in oropharynx	7	31.8
Neck swelling	1	4.5

Note: More than one symptom occurred in some patients

Radiology

All the patients had soft tissue X-ray of the neck (anteroposterior and lateral views) and chest X-ray. Six (27.3%) patients had light barium swallow done to locate the site of impaction of the denture. The plain x-ray soft tissue of the neck also showed air entrapment in nine (40.9%) patients and increased prevertebral soft tissue shadow in 10 (45.5%) patients, while the wire clasps of the broken denture was shown in six (27.3%) patients. All the patients with air entrapment also had an increase in their prevertebral soft tissue shadow.

Treatment

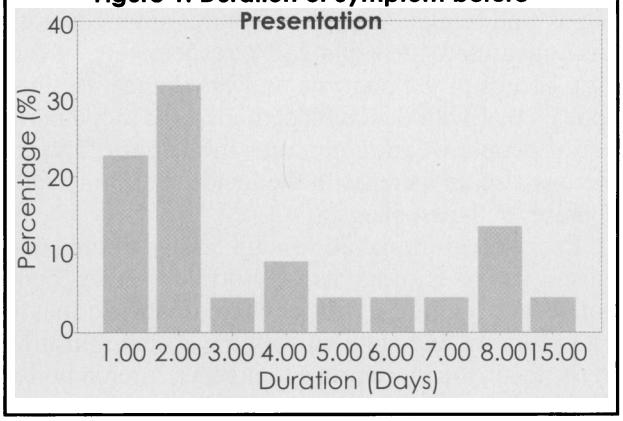
One patient had spontaneous expulsion of the denture, while the remaining patients underwent rigid esophagoscopy under endotracheal general anesthesia with adequate muscle relaxation. Shears forceps were used in two patients to fragment the dentures before extraction.

Three patients had failed extraction via rigid esophagoscopy but later had cervical esophagotomy for the extraction of the dentures, while a fourth patient died of massive hematemesis before definitive intervention. Another patient had an initial feeding gastrostomy but discharged herself against medical advice before esophagotomy via a thoracotomy approach could be performed. All patients had broad spectrum antibiotics commenced presurgery, and this was continued postsurgery.

Level of Impaction

A majority of the dentures [14 (63.6%)] were impacted in the upper esophagus (between the cricopharyngeus and the thoracic inlet), while seven (31.8%) and one (4.5%) were impacted in the upper thorax and lower esophagus, respectively.

Figure 1. Duration of Symptom before Presentation



Complications

Two patients had cervical esophagotomy and drainage of parapharyngeal abscess, while another patient was the only documented fatality in this study resulting from an esophago-carotid fistula. The degree of mucosal injury varied from bruising of the esophageal mucosa which was noted in 10 (45.5%), erythema and inflammatory edema in 17 (77.3%), and laceration in two (9.1%) patients. (Seven patients had more than one feature.)

All mucosal injuries were successfully managed conservatively with nasogastric tube feeding, parenteral broad-spectrum antibiotics, and analgesics within a week postoperatively. A patient who had surgical emphysema secondary to a perforation also responded satisfactorily to conservative treatment within 13 days, while another who had pulmonary edema was successfully managed in the intensive care unit of the hospital and discharged home after 24 days postoperatively.

Duration of Hospitalization

The mean duration of hospital admission before discharge was 9.4 days (SD ± 9.2) with a range of 1–32 days.

Type of Denture

Nine (40.9%) were upper dentures, while lower denture and palatal plate were each three (13.6%), respectively. In seven patients, the denture types were not stated. A majority of the patients [14 (63.6%)] had worn their dentures for more than 10 years without check-up.

DISCUSSION

Replacing missing teeth, apart from improving facial esthetics, makes eating a more pleasant experience and enhances clarity of speech. It also prevents tilting of adjacent teeth, supra eruption of the opposing tooth/teeth, and impaction of food in the edentulous spaces. As predicted by Okeowo[4] and Okafor[5] and noted by Nwafo et al,[2] *artificial* denture use has increased among Nigerians. In previous studies from Lagos[4] and Enugu,[5] impacted dentures among Nigerians constituted 4.9% and 2.2%, respectively, of foreign bodies in the pharynx and esophagus. It, thus, appears that with the coincident increase in the number of people wearing dentures in the past 25 years there is also an increase in the incidence of impacted dentures in the esophagus.

Esophageal-impacted foreign bodies in the adult have a varied etiology as in children.[5,6] It has been noted that edentulous patients are unable to masticate properly, and coupled with the absent sensation of the teeth, are more prone to ingest a foreign body.[5] Though wearing of dentures that induce decreased sensitivity of the oral cavity has been incriminated by some workers,[6,7] Phillipps et al.[8] and Okeowo[4] found no significant association between the incidence of wearing and impaction of dentures in an age-matched population.

It has been observed in our environment that individuals presenting with esophageal impaction ingested whole kola nuts or other objects in ritual ceremonies which are intended to offer them protection, or in some cases, make them rich.[4] Our findings are in agreement with the impressions of Phillipps et al.[8] and Okeowo[4] that misfortune, carelessness through people bolting/hurrying over their food, and ignorance are the main reasons for ingesting foreign bodies. This is supported by the fact that in our study about 63.3% of the patients had worn their dentures for over 10 years without check-up. All the dentures in the present study were transitional acrylic partial dentures, which are not as retentive and rugged as those with metallic framework and, hence, cannot withstand everyday forces readily.[9] After loss of teeth, the alveolus and consequent residual ridges continue to resorb as one ages, resulting in a loose-fitting denture that requires adjustment. Apart from getting easily dislodged, such a denture can give rise to ulceration and infection in the oral cavity. However, from the present study, it appears that females are more conscious of these facts and tend to take care of their dentures better than males, hence the male: female ratio of 2.7:1 in our study. In the studies of Okeowo,[4] Okafor,[5] Nandi and Ong[10] with four (2.2%), four (4.9%), and 16 (0.9%) of their study population, respectively, as impacted dentures, the sex distribution was not mentioned. However, Nwafo et al.[2] had a male:female ratio of 2:1, while the case report of Lavine and Stoopack[9] was a male, which supports our contention.

Usually the diagnosis of an impacted denture is not in doubt, as the patient's history and clinical signs indicate this. Accurate radiological localization of the site of impaction preoperatively, however, may be difficult even with the use of contrast medium.[2] This is because most dentures are made of acrylic resins that are radiolucent. It may be possible to observe air entrapment around the denture or increase in the prevertebral soft tissues on plain x-rays, especially when a local inflammatory response has set in,[8] a feature also observed in our study.

The upper esophagus was the most common site of impaction. This is in agreement with the findings of other studies.[10,11] We observed that the level of impaction and the ease with which a denture was extracted depended on its size, configuration, and the type of denture. Upper dentures usually have larger surface areas than the lower dentures, which make them easier to extract. Considering the wire

clasps and collets (sharp edges) of a denture, which enhance its arrest when ingested, it is not surprising that impactions in the lower esophagus are rare. Shears forceps are invaluable in the fragmentation of dentures before extraction.

Endoscopic extraction of dentures carries a high risk of perforation.[2,8] Factors responsible for this include the size, rigidity, sharp edges of the dentures, and attempting extraction in less-than-ideal situations. In addition to these, the degree of periesophagitis at the site of impaction may increase the risk of perforation.[2,10] Thus, there is no room for expectant or conservative management in cases of impacted dentures, as the risk of complications increase the longer it takes before appropriate surgical intervention.[4,10,12] It then becomes imperative for the denture to be removed under direct vision as soon as a diagnosis is made.

Perforations of the esophagus can occur after a sharp object of any size has entered the esophagus.[13] Five of our patients who had esophageal perforation included three patients that subsequently had esophagotomy, the patient with surgical emphysema, and the only fatality we had. We postulate that the patient may have died from an esophago-carotid fistula. A postmortem was not carried out on the body as a result of the religious inclination of the patient. The clinical course on admission was rather dramatic as there was no noted "signal" hemorrhage prior to the commencement of the exsanguinating hematemesis.

Several reports abound on the existence of a fistulous connection between the esophagus and major blood vessels either secondary to a foreign body, syphilitic aortic aneurysm, or of peptic origin.[10,12,14-16] This is a dreadful complication as noted by Nandi and Ong,[10] and O'Donell et al.,[16] and prompt diagnosis and early aggressive surgery using extra anatomic bypass procedures may save the lives of some of the patients.

Though the majority (54.5%) of our patients presented within 48 hours, this was not impressive enough. Part of the reason for late presentation may have been inadequate finances and a poor knowledge of where to seek appropriate treatment. Another indirect observation that followed from discussion with a few affected patients was that some of them had actually gone through shortcuts of obtaining their dentures from nonmedically qualified personnel.

CONCLUSION

Denture impaction and its endoscopic extraction carry a high risk of perforation. Extraction of an impacted denture via rigid esophagoscopy can be undertaken under direct vision and in an ideal situation with judicious use of the Shears forceps. In the absence of these, the safest option is an esophagotomy.

There should be proper treatment planning and incorporation of retentive designs in the fabrication of dentures by qualified personnel and appropriate radiopaque materials in the dental resins by manufacturers. Patients should also be educated on the importance of adherence to instructions of mechanics of use, life span, maintenance of dentures, and maintenance recall visits to assess the retention of dentures. The use of fractured denture fragments and Superglue to fix such dentures should be avoided.

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